INVESTIGATION INTO THE CONTROL OF TRACHOMA IN SEKHUKUNILAND

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Sekhukuniland is a Native reserve in the North-Eastern Transvaal, lying approximately in the middle of a triangle formed by Lydenburg, Middelburg and Pietersburg. The population is over 160,000 and consists of the Bapedi Bantu tribes.

N. L. Murray[1] in his thesis on the geographical distribution of trachoma in South Africa emphasized this particular area as being one of the worst in the country. In a survey[2] carried out in Sekhukuniland in 1952 trachoma was found in 94% of a random sample of children. The excellent thesis of R. St. H. Warren[3] based on many years' work at this hospital placed the diagnosis of trachoma beyond doubt; his statistics showed a 97% incidence among the Bapedi over the age of 2 years. It seems unnecessary in the face of this proven and, one hopes, accepted fact that

trachoma is endemic in Sekhukuniland, to waste time and space merely stressing this only too obvious revelation.

In this paper, we are concerned with the explanation of an extraordinary discrepancy in the incidence of trachoma on the Sekhukuniland 'Flats' as compared with the plateau of the nearby Lulu mountains. We hope to apply our results and conclusions to the public-health control of the disease.

SURVEYS ON THE SEKHUKUNILAND FLATS

Sekhukuniland 'Flats' is a word coined for want of a better one, for this territory is essentially hilly, with ground as high as 6,000 feet. The changes of altitude of the general level of the ground are gradual, although koppies project irregularly all round.

Material

Surveys were held at 9 kraals: Knwane, Nchabeleng, Mohlaletsi, Magnet Heights, Mphanama, Malegale, Probeeren Mamone and Mattlala. These particular places were chosen in an attempt to obtain a cross-section of the population. In each survey all the local school children and some of the adult population were examined.

Results

A total of 2,096 people were examined over the age of 2 years. The statistics are tabulated below:

Total number of cases	2,096
Incidence of trachoma	100%
Incidence of activity	44%
Incidence of Herbert's pits	80%
Incidence of follicular type	40%
Incidence of trichiasis	7%

We were able to diagnose trachoma by naked-eye examination in 98% of all cases. In the remaining 2% who seemed, naked-eye, to be free of trachoma, a typical pannus was seen in every case when examined with a loupe.

Flies plagued us at all kraals where surveys were held. A more daring, persistent and aggravating type of common housefly we have never before experienced. It was commonplace to see as many as 20 flies sitting on a child's face dabbling in the mucoid discharges from nose or eye or clustered on the sores of impetigo (Fig. 1). Each patient brought a new swarm of flies to greet us. Sometimes the interruptions to expel flies from one's nose and eyes were so frequent that it was difficult to keep pen to paper long enough to write down the patient's name, age and address. The complacent attitude of the local inhabitants towards the flies is readily understood; a life devoted to driving flies out of one's eyes, nose, mouth and food, would soon result in a nervous breakdown as the battle was gradually lost. Fly tolerance and all that goes with it allows a more constructive existence to continue until the complications of trachoma and other fly-spread diseases take charge. Association of ideas rather than coincidence would probably account for the Bapedi word for eyelash and fly being almost identical. *Dinthsi* (pronounced *Dientsh*) means a fly, whereas *Dinthsee* (pronounced *Dientshey*) means an eyelash.

Fig. 1. A common sight on the Sekhukuniland 'flats'. The picture speaks for itself—a sight for sore eyes!

Water Supply. In spite of the plentiful water in the Lulu mountains, the Natives on the Flats suffer greatly from drought. Within half a day of substantial rainfall in the mountains, a river flowing over the Flats will dry up completely, and the Natives are then compelled to seek water by digging in the dry river bed (Fig. 2).

Fig. 2. Young Bapedi woman digging for water in dry river bed 5 miles from the foot of the mountain, where the river is a substantial and fast-flowing stream.

THE LULU MOUNTAIN PLATEAU SURVEY

The enchanting mauve horizon of the Lulu mountains some 11 miles distant from the hospital, coupled with the somewhat suggestive name, prompted us to explore this range. Beauty may be skin deep, but this in no way applies to the Lulus, where we found a haven flowing with fresh water and practically free from flies. We felt compelled to revisit the mountain equipped to carry out an eye survey.

Material

The inhabitants of the Lulu mountains are primitive and isolated, and often ran away as we approached. They do not appear to mix with the Bapedi on the

'Flats' and rarely, if ever, leave their mountain plateau. The plateau is very well watered by streams and springs By our own observation and from the questioning of the inhabitants by our accompanying two Bapedi medical orderlies, we established that their crops and diet were identical with those of the 'Flats' despite the excellent water supply.

Our survey covered about 15 miles of the Lulu mountains between Maila and Schoonoordt, and included 97 people above the age of 7 years taken at random at 10 of the small kraals lying in that area. Ninety of those examined had lived all their lives on the Lulu mountains. The remaining 7 consisted of 5 schoolboys attending a school on the flats, a widely-travelled and well-known witch-doctor, and a woman who before her marriage lived on the Flats. On examination these 7 were all found to be suffering from trachoma.

We were unable to find a single case of trachoma among the 90 permanent residents (our examination included the use of a corneal loupe). Where was the border-line between the trachoma-ridden population of the Flats and the completely trachoma-free population of the Lulu mountain plateau, or was there possibly a gradual transition?

In our attempt to find an answer to this question we planned our next survey at Magolego, a kraal

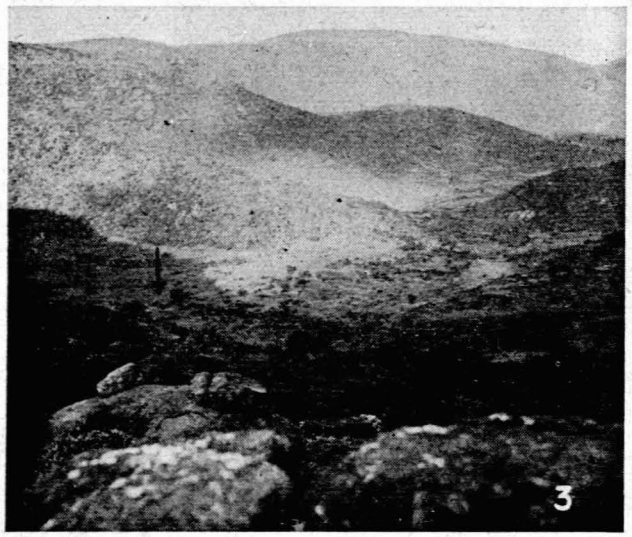

Fig. 3. Photograph taken from edge of the Lulu mountain plateau, where the incidence of trachoma is *nil.* Arrow indicates Magolego Kraal, where the incidence of trachoma is 100%.

situated at the immediate foot of the mountain. The mountain rose steeply immediately behind Magolego until it reached the plateau (Fig. 3). This is a typical feature of this range, and no kraals are found between those at the foot of the mountain and those situated on the plateau.

Survey at Magolego and Comparison of Results

We examined 50 adults taken as a random sample of the 300-strong population of the village. The incidence of trachoma was 100% but the incidence of activity was only 6% as compared with 44% on the Flats proper. A plentiful water-supply was available from near-by mountain streams. The swarms of flies were in no way different from those on the Flats proper.

We present in tabular and diagrammatic form a summary of the important points in our surveys:

	Flats	*Magolego*	*Lulu Mts.*
Trachoma ..	100%	100%	0%
Activity	44%	6%	0%
Flies	Swarms	Swarms	Occasional one
Water	Shortage	Plentiful	Plentiful
Diet ..	..Essentially the same at all places		

Note

1. A plentiful supply of water where the flies were as plentiful as on the Flats cut down the percentage of active cases.
2. A plentiful supply of water where flies are occasionally seen is a combination which is not associated with trachoma.
3. The same diet was common to all groups considered.

Conclusion and Discussion

We conclude from the results of our investigations that the incidence of trachoma in Sekhukuniland depends on 2 factors, the prevalence of swarms of flies which directly convey the infection, and the acute shortage of water which prevents minimal hygienic precautions.

We found no evidence to support the theory that malnutrition plays a major part in the etiology and spread of trachoma. We were unable to recognize the condition of so-called pseudo-trachoma.

THE CONTROL OF TRACHOMA IN SEKHUKUNILAND

1. *The Provision of Adequate Water Supplies*

The Lulu mountains, where streams and springs abound provide an obvious catchment area. Strategically placed dams would prevent much of the present adequate rainfall from going to waste. What a tragedy it is to see a fast-flowing river dry up completely within half a day of substantial rainfall in the mountains.

2. *The Control of Flies*

This is a more difficult, but still possible, task. Because of the Bapedi's ignorance of the principles of sanitation the veld surrounding kraals is used as open latrines. The cattle—the Natives' wealth—are naturally herded next to the kraals where the people live. This state of affairs provides unlimited breeding-grounds for the fly.

One often feels that the energy and money spent in the education of the backward Native in South Africa are misdirected; for example, when one is constantly meeting local adolescents who, although proficient in arithmetic, algebra, reading and writing, appear quite ignorant of the enormous good they could do by converting the cattle manure into compost for the lands. The fact that flies convey disease would be received as a joke or a fairy tale.

The use of modern insecticides, coupled with a few principles of hygiene and common sense, would be the answer to this aspect of the problem.

Why so few Flies on the Lulu Mountain Plateau?

The only explanation we can suggest for the scarcity of flies and absence of trachoma is that the abrupt

change of altitude must in some way interfere with fly-life. The cattle possessed by the Lulu mountain inhabitants are kept in kraals adjoining the dwellings, and the veld is used as open latrines; hence there would appear to be the same adequate breeding grounds available as on the Flats and at Magolego.

It is interesting to note that altitude has formerly been suggested as a possible deterent to the progress of trachoma. Doralone[4] remarked that, as trachoma heals spontaneously at certain altitudes, a garrison town should be created at high altitude for the isolation of trachomatous people. Doralone's inference was hotly contested by Morax and also by Hirschberg,[5] who demonstrated trachoma at an altitude of 9,000 feet in Colorado.

It would appear that in Sekhukuniland it is the *sudden* change in altitude which is significant. The actual height in feet above sea-level seems to have little influence, for many parts of the Sekhukuniland Flats are indeed as high as the Lulu mountain plateau. Possibly it is the sudden change of altitude that is responsible for the rarity of trachoma in Basutoland—the Switzerland of South Africa.

The Treatment of Active Trachoma with Antibiotics

Experience in the treatment of active trachoma in this hospital has shown two important points:

1. Sulphonamides given parenterally and antibiotic ointment used locally arrests active trachoma and rapidly clears all evidence of the commonly associated secondary infection.

2. The records of this hospital show that this treatment is futile. Many children are treated as many as 4 times during the summer for sub-acute mucopurulent conjunctivitis. Each time treatment has included a full course of parenteral sulphonamides as well as unguentum albucid. Is it possible that a strain resistant to this therapy has been developed? This would not appear to be the case, since all cases treated in hospital, approximately 25 a week, respond immediately to this therapy.

Whether reinfection by flies includes the trachoma virus, or whether it is confined to commonly associated organisms such as the Koch-Weeks bacillus, we are unable to ascertain. It appears that most emphasis should be laid on the prevention of trachoma by an attack on the fly plague and the provision of an adequate water-supply. In the light of our investigation, it would be total lack of insight to attempt to combat trachoma by drug therapy alone.

The Notification of Trachoma

Three previous surveys by ophthalmologists in Sekhukuniland have reported on the trachoma incidence of over 90% in the population of more than 160,000. Recently district surgeons in the area have been urged to notify every case of trachoma on form 180b. If it took 5 minutes to complete the form for each case this would involve 10,000 hours of a doctor's time, in an area where doctors are at a premium, and it is difficult to appreciate the precise idea behind all this.

SUMMARY

A survey of cases of trachoma in Sekhukuniland is discussed and it is shown that this disease occurs in 100% of the population of the 'Flats'.

It is found that the disease does not occur in the permanent inhabitants of the plateau on the neighbouring Lulu mountains. The explanation of these facts may be found in the lack of water and the prevalence of flies on the Flats. Where the mountain dwellers live, on the other hand, there is no lack of natural sources of water and only a few flies are found. The fly is indicated as the carrier of the virus and the lack of water for washing as an important secondary cause.

OPSOMMING

'n Opname van gevalle van trachoom in Sekhukuniland word bespreek en daar word aangetoon dat hierdie siekte by 100 persent van die bevolking van die ‚Vlaktes' voorkom.

Daar is gevind dat die toestand nie voorkom by die permanente bewoners van 'n plato geleë op die aangrensende Lulu-berge nie. Die oorsake vir hierdie feite word gesoek in die gebrek aan water, en in die veelvuldigheid van vlieë op die Vlaktes. Die bergbewoners daarenteen het geen gebrek aan natuurlike waterbronne nie, en slegs enkele vlieë word daar gevind. Die vlieg word as draer van die virus bestempel, en die gebrek aan waswater as 'n vername bykomende oorsaak.

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